

PRE-MOISTENED WIPE PRODUCT

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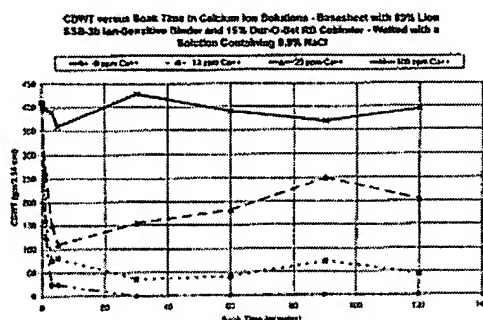
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[57] Abstract:

The present invention provides ion-sensitive, water-dispersible polymers. The present invention also provides a method of making ion-sensitive, water-dispersible polymers and their applicability as binder compositions. The present invention further provides fiber-containing fabrics and webs comprising ion-sensitive, water-dispersible binder compositions and their applicability in water-dispersible personal care products.

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[57] Claims:

CLAIMS What is Claimed is:

1. A wet wipe having an in-use tensile strength of greater than about 100 g/in, wherein the wet wipe has a tensile strength of less than about 70 g/in after being soaked in water having a concentration of about 10 ppm of one or more multivalent ions for about one hour, wherein the wet wipe has a tensile strength of less than about 60% of the in-use tensile strength after being soaked in water having a concentration of about 200 ppm of one or more multivalent ions for about one hour, wherein the wet wipe has an opacity greater than about 35%
2. The wet wipe of Claim 1, wherein the wet wipe has an in-use tensile strength of greater than about 100 g/in, a tensile strength of less than about 50 g/in after being soaked in water having a concentration of about 10 ppm of one or more multivalent ions for about one hour and a tensile strength of less than about 40% of the in-use tensile strength after being soaked in water having a concentration of about 200 ppm of one or more multivalent ions for about one hour.
3. The wet wipe of Claim 1, wherein the wet wipe has an in-use tensile strength of greater than about 100 g/in, a tensile strength of less than about 30 g/in after being soaked in water having a concentration of about ppm of one or more multivalent ions for about one hour and a tensile strength of less than about 20% of the in-use tensile strength after being soaked in water having a concentration of about 200 ppm of one or more multivalent ions for about one hour.
4. The wet wipe of Claim 1, wherein the wet wipe has an in-use tensile strength of greater than about 200 g/in, a tensile strength of less than about 50 g/in after being soaked in water having a concentration of about ppm of one or more multivalent 30 ions for about one hour and a tensile strength of less than about 40% of the in-use tensile strength after being soaked in water having a concentration of about 200 ppm of one or more multivalent ions for about one hour.
5. The wet wipe of Claim 1, wherein the wet wipe has an in-use tensile strength of greater than about 200 g/in, a tensile strength of less than about 30 g/in after being soaked in water having a concentration of about ppm of one or more multivalent ions for about one hour and a tensile strength of less than about 20% of the in-use tensile strength after being soaked in water having a concentration of about 200 ppm of one or more multivalent ions for about one hour.
6. The wet wipe of Claim 1, wherein the wet wipe has an in-use tensile strength of greater than about 300 g/in, a tensile strength of less than about 50 g/in after being soaked in water having a concentration of about ppm of one or more multivalent ions for about one hour and a tensile strength of less

than about 40% of the in-use tensile strength after being soaked in water having a concentration of about 200 ppm of one or more multivalent ions for about one hour.

7. The wet wipe of Claim 1, wherein the wet wipe has an in-use tensile strength of greater than about 300 g/in, a tensile strength of less than about 30 g/in after being soaked in water having a concentration of about ppm of one or more multivalent ions for about one hour and a tensile strength of less than about 20% of the in-use tensile strength after being soaked in water having a concentration of about 200 ppm of one or more multivalent ions for about one hour.

8. The wet wipe of Claim 1, wherein the wet wipe has a thickness greater than about 0.25 mm.

9. The wet wipe of Claim 1, wherein the wet wipe has a thickness greater than about 0.3 mm.

10. The wet wipe of Claim 1, wherein the wet wipe has a thickness greater than about 0.4 mm.

11. The wet wipe of Claim 1, wherein the wet wipe has a cup crush less than about 40 g.

12. The wet wipe of Claim 1, wherein the wet wipe has a cup crush less than about 25 g.

13. The wet wipe of Claim 1, wherein the wet wipe has a cup crush less than about 10 g.

14. The wet wipe of Claim 1, wherein the wet wipe comprises a fabric sheet saturated with a wetting composition, wherein the fabric sheet comprises fibrous material and an ion-sensitive binder, and wherein the wetting composition contains less than about 5 weight percent of organic solvents.

15. The wet wipe of Claim 14, wherein the wetting composition contains less than about 3 weight percent of organic solvents.

16. The wet wipe of Claim 15, wherein the wetting composition contains less than about 1 weight percent of organic solvents.

17. The wet wipe of Claim 14, wherein the wetting composition is substantially free of organic solvents.

18. The wet wipe of Claim 14, wherein the wetting composition comprises an activating compound at a concentration of at least 1 weight percent based on the weight of the wetting composition. 19. The wet wipe of Claim 18, wherein the activating compound comprises a monovalent salt and is present at a concentration of at least 1 weight percent based on the weight of the wetting composition.

20. The wet wipe of Claim 19, wherein the activating compound is present at a concentration of from about 1 weight percent to about 10 weight percent based on the weight of the wetting composition.

21. The wet wipe of Claim 20, wherein the activating compound is present at a concentration of from about 1 weight percent to about 5 weight percent based on the weight of the wetting composition.
22. The wet wipe of Claim 21, wherein the activating compound is present at a concentration of about 4 weight percent.
23. The wet wipe of Claim 18, wherein the activating compound is sodium chloride.
24. The wet wipe of Claim 14, wherein the ion-sensitive binder comprises at least one of an ion-sensitive polymer and a co-binder.
25. The wet wipe of Claim 24, wherein the ion-sensitive polymer is formed from (a) at least one of acrylic acid and methacrylic acid, and (b) one or more alkyl acrylates.
26. The wet wipe of Claim 24, wherein the ion-sensitive polymer is formed from one or more monomers selected from acrylic acid; 2-acrylamido-2-methyl-1 propanesulfonic acid (AMPS); the sodium salt of 2-acrylamido-2-methyl-1 propanesulfonic acid (NaAMPS); butyl acrylate; and 2-ethylhexyl acrylate.
27. The wet wipe of Claim 24, wherein the co-binder is selected from non crosslinking poly(ethylene-vinyl acetate), non-crosslinking poly(styrene-butadiene), and non-crosslinking poly(styrene-acrylic).
28. The wet wipe of Claim 27, wherein the co-binder is non-crosslinking poly(ethylene-vinyl acetate).
29. The wet wipe of Claim 14, wherein the wetting composition comprises: about 86 to about 98 weight percent deionized water; about 1 to about 6 weight percent sodium chloride as the activating JO compound; up to about 2 weight percent of one or more preservatives; up to about 2 weight percent of one or more surfactants; up to about 1 weight percent of one or more silicone emulsions; up to about 1 weight percent of one or more emollients; 25 up to about 0.3 weight percent of one or more fragrances; up to about 0.5 weight percent of one or more fragrance solubilizers; and up to about 0.5 weight percent of one or more pH adjusters.
30. The wet wipe of Claim 29, wherein the wetting composition comprises: about 86 to about 98 weight percent of deionized water; about 1 to about 6 weight percent of sodium chloride as the activating compound; from greater than 0 to about 2 weight percent of one or more preservatives comprising glycerin, iodopropynyl butylcarbamate (IPBC), and dimethyloldimethyl 35 (DMDM) hydantoin; from greater than 0 to about 2 weight percent of a surfactant comprising acyl glutamate; from greater than 0 to about 1 weight percent of one or more silicone emulsions comprising dimethiconol and triethanolamine (TEA) dodecylbenzene sulfonate; from greater than 0 to about 1 weight percent of an emollient comprising 5 PEG-75 Lanolin; from greater than 0 to about 0.3 weight percent of one or more fragrances; from greater than 0 to

about 0.5 weight percent of a fragrance solubilizer comprising polysorbate 20; and from greater than 0 to about 0.2 weight percent of a pH adjuster comprising l-malic acid.

31. The wet wipe of Claim 30, wherein the wetting composition comprises: about 92.88 weight percent of deionized water; about 4.00 weight percent of sodium chloride as the activating compound; about 1.00 weight percent of one or more preservatives comprising glycerin, 5 IPBC, and DMDM hydantoin; about 1.00 weight percent of a surfactant comprising acyl glutamate; about 0.50 weight percent of one or more silicone emulsions comprising dimethiconol and TEA dodecylbenzene sulfonate; about 0.25 weight percent of an emollient comprising PEG-75 Lanolin; about 0.05 weight percent of one or more fragrances; about 0.25 weight percent of a fragrance solubilizer comprising polysorbate 20; and about 0.07 weight percent of a pH adjuster comprising l-malic acid.

32. A wet wipe comprising a fabric sheet saturated with a wetting composition, wherein the fabric sheet comprises fibrous material and an ion-sensitive binder, and wherein the wetting composition contains less than about 5 weight percent of organic solvents; wherein the wet wipe has an in-use tensile strength of greater than about 100 g/in, wherein the wet wipe has a tensile strength of less than about 70 g/in after being soaked in 20 water having a concentration of about 10 ppm of one or more multivalent ions for about one hour, wherein the wet wipe has a tensile strength of less than about 60% of the in-use tensile strength after being soaked in water having a concentration of about 200 ppm of one or more multivalent ions for about one hour.

33. The wet wipe of Claim 32, wherein the fibrous material comprises one or more layers of a woven fabric, a nonwoven fabric, a knitted fabric, or a combination thereof.

34. The wet wipe of Claim 32, wherein the fibrous material comprises one or 30 more layers of a nonwoven fabric.

35. The wet wipe of Claim 32, wherein the fibrous material comprises fibers having a length of about 15 mm or less.

36. The wet wipe of Claim 32, wherein the fibrous material comprises natural fibers, synthetic fibers, or a combination thereof.

37. The wet wipe of Claim 32, wherein the fibrous material comprises one or more fibers containing cotton, linen, Jute, hemp, wool, wood pulp, viscose rayon, cuprammonium rayon, cellulose acetate, polyester, polyamide, and polyacrylic.

38. The wet wipe of Claim 32, wherein the fibrous material comprises wood pulp.

39. The wet wipe of Claim 32, wherein the wet wipe has an in-use tensile strength of greater than about 100 g/in, a tensile strength of less than about

50 g/in after lo being soaked in water having a concentration of about 10 ppm of one or more multivalent ions for about one hour and a tensile strength of less than about 40% of the in-use tensile strength after being soaked in water having a concentration of about 200 ppm of one or more multivalent ions for about one hour.

40. The wet wipe of Claim 32, wherein the wet wipe has an in-use tensile strength of greater than about 100 g/in, a tensile strength of less than about 30 g/in after being soaked in water having a concentration of about 10 ppm of one or more multivalent ions for about one hour and a tensile strength of less than about 20% of the in-use tensile strength after being soaked in water having a concentration of about 200 ppm of one or 20 more multivalent ions for about one hour.

41. The wet wipe of Claim 32, wherein the wet wipe has an in-use tensile strength of greater than about 200 g/in, a tensile strength of less than about 50 g/in after being soaked in water having a concentration of about ppm of one or more multivalent 25 ions for about one hour and a tensile strength of less than about 40% of the in-use tensile strength after being soaked in water having a concentration of about 200 ppm of one or more multivalent ions for about one hour.

42. The wet wipe of Claim 32, wherein the wet wipe has an in-use tensile strength of greater than about 200 g/in, a tensile strength of less than about 30 g/in after being soaked in water having a concentration of about 10 ppm of one or more multivalent ions for about one hour and a tensile strength of less than about 20% of the in-use tensile strength after being soaked in water having a concentration of about 200 ppm of one or more multivalent ions for about one hour.

43. The wet wipe of Claim 32, wherein the wet wipe has an in-use tensile strength of greater than about 300 g/in, a tensile strength of less than about 50 g/in after being soaked in water having a concentration of about ppm of one or more multivalent ions for about one hour and a tensile strength of less than about 40% of the in-use tensile strength after being soaked in water having a concentration of about 200 ppm of one or more multivalent ions for about one hour.

44. The wet wipe of Claim 32, wherein the wet wipe has an in-use tensile strength of greater than about 300 g/in, a tensile strength of less than about 30 g/in after being soaked in water having a concentration of about 10 ppm of one or more multivalent ions for about one hour and a tensile strength of less than about 20% of the in-use tensile strength after being soaked in water having a concentration of about 200 ppm of one or lo more multivalent ions for about one hour.

45. The wet wipe of Claim 32, wherein the wet wipe has a thickness greater

than about 0.25 mm.

46. The wet wipe of Claim 32, wherein the wet wipe has a thickness greater than about 0.3 mm.

47. The wet wipe of Claim 32, wherein the wet wipe has a thickness greater than about 0.4 mm.

48. The wet wipe of Claim 32, wherein the wet wipe has a cup crush less than about 40 g.

49. The wet wipe of Claim 32, wherein the wet wipe has a cup crush less than about 25 g.

50. The wet wipe of Claim 32, wherein the wet wipe has a cup crush less than about 10 g. 30S1. The wet wipe of Claim 32, wherein the wetting composition contains less than about 3 weight percent of organic solvents.

52. The wet wipe of Claim 51, wherein the wetting composition contains less than about 1 weight percent of organic solvents. 3s 53. The wet wipe of Claim 52, wherein the wetting composition is substantially free of organic solvents.

54. The wet wipe of Claim 32, wherein the wet wipe has an opacity greater than about 20%.

55. The wet wipe of Claim 32, wherein the wet wipe has an opacity greater than about 35%.